

# Braidwood 2

## 4Q/2008 Plant Inspection Findings

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### Initiating Events

**Significance:**  Sep 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

#### **FAILURE TO COMPLY WITH THE SPACING STANDARD FOR SPRINKLER SYSTEMS IN ACCORDANCE WITH THE LICENSEE FIRE PROTECTION PROGRAM REQUIREMENTS**

A finding of very low safety significance and associated NCV of Braidwood's License Condition 2.E was identified by the inspectors for failure to comply with the spacing standard for sprinkler systems in accordance with the licensee Fire Protection Program (FPP) requirements. Specifically, the inspectors identified three permanent scaffolds that obstructed three separate fire protection suppression sprinkler heads in the 2B diesel oil storage tank room. No replacement sprinklers had been installed. After the inspector's identification of this issue the licensee removed the decking and open grating from the scaffolds, which allowed the permanent scaffold configuration to be within the FPP requirements. The inspectors determined that the licensee's failure to comply with the spacing standard for sprinkler systems in accordance with the Braidwood FPP was a performance deficiency. The inspectors concluded that the finding was greater than minor because this issue was associated with the external factor attribute of the Initiating Events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors determined that the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Appendix F, because it was associated with fire protection defense in depth strategies involving the suppression system. The inspectors determined that the finding has a low degradation rating since only three out of eleven sprinklers in the room were obstructed and for each sprinkler obstructed there was another functional head within ten feet of combustible concern. In addition, other aspects of the system complied with NFPA code. Therefore, the finding was determined to be of very low safety significance. This finding has a cross cutting aspect in the area of Human Performance because the licensee failed to properly evaluate the scaffolding placement due to the engineering staff using poor assumptions.

Inspection Report# : [2008004](#) (*pdf*)

**Significance:** SL-IV Sep 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

#### **FAILURE TO PROPERLY EVALUATE REMOVAL OF CARBON DIOXIDE FIRE SUPPRESSION FOR THE UPPER CABLE SPREADING ROOM CARBON DIOXIDE FIRE SUPPRESSION**

A finding of very low safety significance and an associated NCV of Braidwood Operating License Condition 2.E was identified by the inspectors for the licensee's failure to obtain NRC approval before making changes to the approved FPP. Specifically, the licensee permanently isolated the manual carbon dioxide (CO<sub>2</sub>) suppression system to the upper cable spreading rooms (UCSRs) without prior NRC approval. The licensee entered this issue in the corrective action program (CAP) and implemented compensatory actions to verify detection system operability and implement fire watches upon any single detector failure. Additionally, the licensee plans to submit a licensee change request associated with the removal of CO<sub>2</sub> suppression from the UCSRs. The finding was determined to be more than minor because the inspectors could not reasonably determine that the isolation would not have ultimately required NRC prior approval. The inspectors determined this finding to be a Severity Level IV violation due to having very low safety significance (Green) based on the Phase 2 SDP evaluation. This finding is related to the cross cutting area of Human Performance for failure to use conservative assumptions in decision-making and to adopt a requirement that demonstrates the proposed action is safe in order to proceed with respect to reviewing the plant design and license basis. (H.1(b))

Inspection Report# : [2008004](#) (*pdf*)

**Significance:**  Jun 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

### **FAILURE TO PROPERLY IMPLEMENT MATERIAL CONTROL PROCEDURES**

The inspectors identified a performance deficiency involving a NCV of Technical Specifications 5.4.1, related to the unauthorized and improper storage of loose material in the designated material exclusion area around the Unit 1 and Unit 2 transformers. The inspectors identified this issue on a number of occasions. After each occurrence, the licensee took immediate corrective actions by either removing loose material out of the transformer yard or properly securing the material being stored in the transformer yards.

The inspectors concluded that the finding was more than minor because loose/unsecured material in the transformer yards increased the likelihood of those events occurring that could upset plant stability. Specifically, during high wind speed conditions the loose material could have affected the main power transformers and could have caused a unit trip or it could have affected the station auxiliary transformers that could increase the likelihood of a loss of mitigating systems. In each case however, the inspectors concluded that there was not enough debris in either area to affect both transformers simultaneously. The finding was determined to be of very low safety significance because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating equipment or functions would not be available. The primary cause of this NCV was related to the cross-cutting aspect in the area of Human Performance in the Work Practices component (Item H.4.(b)). Multiple groups, including contractors and operators failed to properly implement the procedures for control of material in the transformer exclusion zones. The preliminary cause appeared to be inadequate supervisory and management oversight of work activities.

Inspection Report# : [2008003](#) (*pdf*)

**Significance:**  Jun 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

### **INADEQUATE PROCEDURE**

The inspectors identified a performance deficiency involving a NCV of Title 10 of the Code of Federal Regulations (10 CFR), Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," related to a plant barrier impairment (PBI) procedure. The procedure for PBI did not contain steps to ensure that relied-upon compensatory measures were maintained. Specifically, while the B Train room of essential service water had a flood barrier removed and covered under a PBI, the compensatory measure of sump alarms were found not functioning. The licensee has entered the issue into their corrective action program, repaired the sump alarms, and plans to revise the PBI procedure. The inspectors concluded that the finding was greater than minor because the licensee failed to effectively manage prescribed compensatory measures related to a cornerstone objective. The finding was determined to be of very low safety significance based on a SDP Phase 1 screening in accordance with IMC 0609, Table 4a, because the finding did not increase the likelihood of an external or internal flood. The primary cause of this NCV was related to the cross-cutting component of Human Performance for Resources (Item H.2.(c)) because the licensee's PBI procedure was not adequate in that it did not ensure safety margins were maintained by providing instructions to periodically verify that the compensatory measures were still available.

Inspection Report# : [2008003](#) (*pdf*)

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## **Mitigating Systems**

**Significance:**  Dec 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Control of High Pressure Gas Cylinders**

A finding of very low safety significance and an associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, was identified by the inspectors for the failure to properly control high pressure gas

cylinders in proximity to safety-related equipment. The licensee entered this into their CAP and made the restraint of the gas cylinders seismically qualified.

The inspectors determined that the failure to properly evaluate the installation and storage of high pressure gas cylinders in plant area AB-401 and AB 426 was contrary to the design basis and was a performance deficiency. The finding was more than minor because the finding was similar to IMC 0612, Appendix E, Example 4a, in that no engineering evaluation was performed to assess the seismic impact on the gas cylinders, where safety related equipment was potentially effected. Therefore, this performance deficiency also impacted the mitigating systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors performed a phase 1 significance determination process screening and the finding was determined to be potentially risk significant due to external initiating event core damage sequences. The regional SRA determined that the Phase 2 SDP pre solved tables/worksheets did not clearly address the inspection finding. Therefore, the SRA performed an SDP Phase 3 analysis and determined the issue was of very low safety significance.

Inspection Report# : [2008005](#) (*pdf*)

**Significance:**  Dec 31, 2008

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Inadequate Corrective Action for Containment Spray Add Tank Drain Drain Valve**

A Green finding and associated non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, was self-revealed when leak-by of valve 2CS023 led to a 100 gallon sodium hydroxide (NaOH) spill that leaked into the 2A RH pump room and rendered the 2A RH pump unavailable on September 30, 2008. The licensee failed to take adequate corrective actions to address previous leak-by of valve 2CS023. This finding has a cross-cutting aspect in the area of human performance (H.4(a)).

The inspectors determined that the failure to properly verify the adequacy of lubricating the 2CS023 valve stem for better valve operation was a performance deficiency. The finding was more than minor because it impacted the mitigating systems cornerstone attribute to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors performed a Phase 1 SDP review of this finding and determined the issue was of very low safety significance. (Section 1R15)

Inspection Report# : [2008005](#) (*pdf*)

**Significance:**  Oct 24, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to take timely corrective action for a previously identified NRC violation.**

The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, for failure to take timely corrective actions to address a previously issued NCV regarding the substitution of manual actions for automatic actions on the A train auxiliary feedwater pumps. Specifically, the licensee did not perform a full evaluation in accordance with 10 CFR 50.59 for the addition of new Step, 2.c, in Revision 101 of Abnormal Operating Procedure 1/2BwOA-ELEC-4, "Loss of Offsite Power," which instructed operators to place the A train auxiliary feedwater pumps in pull-out position. This violation was originally identified by NRC inspectors in January 2007. The inspection team identified that the licensee had not taken timely actions to correct the violation.

This finding was considered to be more than minor because it impacted the procedure quality attribute of the mitigating systems cornerstone. As a result, the inspectors completed a Phase 1 Significance Determination Process Screening in accordance with IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." The inspectors answered 'no' to all of the Mitigating Systems Cornerstone questions in Table 4a of IMC 0609, Attachment 4, and determined the issue to be of very low safety significance, Green. This issue of untimely corrective actions was entered into the licensee's corrective action program, and the licensee took immediate corrective actions by issuing Revision 104 to 1/2BwOA-ELEC-4, which removed Step 2.c until the full 50.59 evaluation was completed.

Inspection Report# : [2008009](#) (*pdf*)

**Significance:**  Jun 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

#### **FAILURE TO CONTROL LABELING ON BOTH UNITS CONTROL PANELS AND SIMULATOR**

The inspectors identified a performance deficiency involving a NCV of Technical Specifications 5.4.1, for the licensee's failure to provide procedural controls for the unique identification of Regulatory Guide 1.97 post accident instrumentation to aid the control room operator. Specifically, the licensee failed to adequately control the labeling on both units' control panels and the simulator, resulting in several improperly marked post-accident indicators. The licensee has entered the issue into their corrective action program and labeled the appropriate post-accident instruments. The finding was greater than minor because, if left uncorrected, it could become a more significant safety concern. Inaccurately labeled control room indicators of post-accident instrumentation could lead to confusion and hamper operator response if conflicting indications resulted due to accident conditions. The finding was determined to be of very low safety significance based on a SDP Phase 1 screening in accordance with IMC 0609.04, "Initial Screening and Characterization of Findings." The inspectors did not identify a cross-cutting aspect to this finding.

Inspection Report# : [2008003](#) (*pdf*)

**Significance:**  Mar 28, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

#### **This is a security Related Finding - see inspection report for details.**

This finding, affecting the Mitigating Systems Cornerstone, is related to mitigative measures developed to cope with losses of large areas of the plant; in response to Section B.5.b of the February 25, 2002, Interim Compensatory Measures (ICM) Order (EA-02-026) and related NRC guidance. This finding has been designated as "Official Use Only - Security-Related Information": therefore, the details of this finding are being withheld from public disclosure. This finding has a cross-cutting aspect in the area of Human Performance - conservative assumptions and safe actions. See inspection report for more details.

Inspection Report# : [2008006](#) (*pdf*)

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## **Barrier Integrity**

**Significance:**  Dec 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Inadequate Corrective Action for Failure to Promptly Correct Auxiliary Tunnel Feedwater tunnel Hatch Cover Design Deficiencies**

A finding of very low safety significance and associated non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified by the inspectors for failure to promptly identify and correct the auxiliary feedwater tunnel hatch cover design deficiencies. Specifically, upon finding a design deficiency, the licensee failed to evaluate and correct all deficiencies associated with the design calculation in a timely manner. The licensee has entered the issue into their corrective action program, implemented compensatory measures using temporary modifications, and plans to complete permanent modifications to restore design margins by December 31, 2008.

The finding was more than minor because it was associated with the Barrier Integrity cornerstone attribute of SSC and Barrier Performance (Containment Isolation SSC Reliability) and affected the cornerstone objective of maintaining functionality of containment. The inspectors determined the finding to be of very low safety significance (Green) using the SDP Phase 1 screening worksheets as there was no actual open pathway in the physical integrity of the reactor containment. This finding has a cross-cutting aspect in the area of problem identification and resolution,

corrective action program (CAP), because the licensee did not thoroughly evaluate the problem immediately upon identification. (P.1(c).) (Section 1R15)

Inspection Report# : [2008005](#) (pdf)

**Significance:**  Dec 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Analyze Inlet Piping Loads and Establish an Adequate HUT Quench Volume**

The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," having very low safety significance, associated with the licensee's failure to analyze and establish an adequate quench volume within the boron recycle system holdup tanks and failure to analyze the water hammer loads on boron recycle system holdup tank inlet piping induced by relief valve discharges. Insufficient holdup tank quench volume could result in an overpressure failure of the holdup tank and the water hammer induced piping loads could damage the boron recycle system holdup tank inlet piping system. The licensee corrective actions included changing procedures to maintain a minimum 40 percent boron recycle holdup tank level as a quench volume for system relief valves and initiating an action to perform an analysis to investigate the magnitude of the potential water hammer loads on the inlet piping.

The finding was more than minor because the finding affected the Barrier Integrity Cornerstone objective for maintaining the Radiological Barrier Function of the Containment. The finding was associated with the design control and procedure quality attributes of the Barrier Integrity Cornerstone. The inspectors determined that the failure to establish an adequate boron recycle system holdup tank quench volume and analyze the magnitude of water hammer loads on boron recycle system holdup tank inlet piping degraded the Radiological Barrier Function of the Containment but did not represent an actual open pathway from containment; therefore, the finding screened as having very low safety significance (Green). The inspectors determined that the finding did not have a cross-cutting aspect. (Section 4OA2.5.b.1)

Inspection Report# : [2008005](#) (pdf)

**Significance:**  May 15, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

**INADEQUATE ACCEPTANCE CRITERIA ESTABLISHED IN TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENT**

A finding of very low safety significance and associated Non-Cited Violation of 10 CFR 50, Appendix B, Criterion V, Instructions Procedures and Drawings was identified by the inspectors for the licensee's failure to establish adequate acceptance criteria when performing a surveillance required by the plant's Technical Specifications. Specifically, acceptance criteria ensuring airflow flow from areas of low potential contamination to areas of high potential contamination when performing Technical Specification Surveillance Requirement 3.7.12.4 associated with the nonaccessible area exhaust filter plenum ventilation system in the auxiliary building was not established. The licensee has entered the issue into its corrective action program and intend establish qualitative criteria verifying air flow into spaces containing potential contaminated fluids during post accident conditions. This finding was more than minor because it affected the radiological barrier functionality of the control room and auxiliary building attribute under the barrier integrity cornerstone. The finding was of very low safety significance because all the answers were no to the SDP screening associated with the Barrier's Cornerstone.

Inspection Report# : [2008002](#) (pdf)

**Significance:**  Mar 28, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

**This is a security Related Finding - see inspection report for details.**

This finding, affecting the Barrier Integrity Cornerstone, is related to mitigative measures developed to cope with

losses of large areas of the plant; in response to Section B.5.b of the February 25, 2002, Interim Compensatory Measures (ICM) Order (EA-02-026) and related NRC guidance. This finding has been designated as "Official Use Only - Security-Related Information": therefore, the details of this finding are being withheld from public disclosure. This finding has a cross-cutting aspect in the area of Human Performance - documentation, procedures, and component labeling. See inspection report for more details.

Inspection Report# : [2008006](#) (*pdf*)

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## Emergency Preparedness

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## Occupational Radiation Safety

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## Public Radiation Safety

**Significance:**  Jun 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

### **FAILURE TO SAMPLE A TEMPORARY TANK AT THE REQUIRED PERIODICITY**

A finding of very low safety significance and associated NCV of the Technical Requirements Manual, Appendix L, and Technical Specifications 5.4.1(a) were identified by the inspectors. On May 1, 2008, the inspectors identified that the licensee had failed to sample the temporary wastewater storage tanks installed to hold shower and wash water from the Unit 2 Containment Access Facility at the required frequency of seven days. Procedure RP-BR-654, "Unit 1 (2) Containment Access Facility Liquid and Air Sampling and Disposal Requirements, Revision 0," as written, did not direct the required sampling frequency. The licensee took immediate corrective action by sampling the temporary storage tank, revising the scheduling tool to ensure that the tanks are sampled at least every seven days when radioactive material is being added to the tank, and planning to revise the sampling procedure. The finding involved an occurrence in the licensee's radioactive material control program that is contrary to the licensee's procedures. The finding was more than minor because it impacted the program and process attribute of the Public Radiation Safety Cornerstone and affected the cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive material release into the public domain, in that the failure to measure the levels of radioactivity in the temporary storage tanks had the potential to impact the licensee's effluent program. The inspectors applied the IMC 0609, Appendix D, "Public Radiation Safety Significance Determination Process" to this finding. The finding is in the licensee's radiological effluent monitoring program. The finding did not involve a failure to implement the effluent release program nor did public dose exceed Appendix I, Criterion, or 10 CFR 20.1302(e) and the finding was determined to be of very low safety significance. The primary cause of this NCV was related to the cross-cutting component of Human Performance for Work Practices (Item H.4.(c)) because the licensee did not ensure that supervisory and management oversight of the procedure was adequate to assure nuclear safety.

Inspection Report# : [2008003](#) (*pdf*)

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## Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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## Miscellaneous

**Significance:** N/A Oct 24, 2008

Identified By: NRC

Item Type: FIN Finding

### **PI&R Report Summary**

The team concluded that the implementation of the Corrective Action Program (CAP) at Braidwood was generally good. The licensee had a low threshold for identifying problems and entering them in the CAP. Items entered into the CAP were screened and prioritized in a timely manner using established criteria; were properly evaluated commensurate with their safety significance; and corrective actions were generally implemented in a timely manner, commensurate with their safety significance. The team noted that the licensee was adequate at reviewing and applying industry operating experience lesson learned. Audits and self-assessments were also noted to be acceptable. On the basis of interviews conducted during the inspection, workers at the site expressed freedom to enter safety concerns into the CAP, exhibiting a good safety conscience work environment.

Inspection Report# : [2008009](#) (*pdf*)

Last modified : April 07, 2009